



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/748,612

12/30/2003

David Michael Hoffman

139685

7501

7590

09/09/2005

Patrick W. Rasche
Armstrong Teasdale LLP
Suite 2600
One Metropolitan Square
St. Louis, MO 63102

EXAMINER

MIDKIFF, ANASTASIA

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,612

Applicant(s)

HOFFMAN, DAVID MICHAEL

Examiner

Anastasia Midkiff

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/30/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Drawings

The corrected drawings were received on June 10th, 2004.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the collimator of claim 14, the x-ray focal spot(s) of claims 14-24, and the two cathodes of claims 5 and 17 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 8 is objected to because of the following informalities: The term "x-ray number and energy detector" is indefinite insofar as the type of detector array being specified, and is unclear. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5-7, 9-15, 17-19, and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent to Malamud (USP #6,760,399).

With respect to Claims 1 and 13, Malamud teaches a multi-slice, helical CT imaging apparatus with a plurality of detector arrays on the z-axis (17A, 17B, and 17C, each being composed of two linear arrays), having a radiation source (30) with a beam focal spot, in which said focal spot is wobbled on the z-axis during scanning (See Column 6 Lines 50-55) to preferentially illuminate individual detectors and collect data

Art Unit: 2882

from the detector while it is illuminated by the beam (See Column 1 Lines 32-34), and the method for its use.

With respect to Claims 2 and 14, Malamud teaches the use of a pre-object collimator, in the form of a baffle and screen, on the X-ray source (30) to be wobbled. (See Column 6, Lines 23-46.)

With respect to Claims 3, 6, 15, and 18, Malamud teaches the use of an X-ray tube as the radiation source (30), as well as the method where wobbling comprises controlling the tube focal spot. (See Column 1 Lines 35-39, and Column 3 Lines 7-14.)

With respect to Claims 5 and 17, Malamud teaches the use of two focal spots from more than one X-ray tube cathode source, used alternately. (See Column 1, lines 39-47.)

With respect to Claim 7, Malamud teaches that the object to be scanned is a medical patient. (See Figure 1 Item 14, and Column 5 Lines 60-63.)

With respect to Claims 9 and 21, Malamud teaches the apparatus and method of Claims 1 and 13, as disclosed above, and the use of a pulsed radiation source (30) that is off during the wobbling of the focal spot. (See Column 9 Lines 17-22.)

With respect to Claims 10 and 22, Malamud teaches the apparatus and method of Claims 9 and 21, as disclosed above, and the use of a pulsed radiation source (30) that is off during the wobbling of the focal spot, as well as a pre-object collimator, in the form of a baffle, on the X-ray source (30) to be wobbled, (See Column 9 Lines 17-22, and Column 6, Lines 23-46.)

With respect to Claims 11, 12, 23, and 24, Malamud teaches the X-ray tube radiation source (30) and focal spot, as well as the method of wobbling said focal spot as in Claims 3, 6, 15, and 18, as well as the pulsed radiation source discussed above.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent to Malamud (USP #6,760,399) as applied to claims 1-3 and 13-15 above, in view of U.S. Patent to Khutoryansky et al. (USP #5,901,197).

With respect to Claims 5 and 7, Malamud teaches a multi-slice, helical CT imaging apparatus with a plurality of detector arrays on the z-axis (17 a-b), having a radiation source (30) with a beam focal spot, in which said focal spot is wobbled during scanning to preferentially illuminate individual detectors (33A) and collect data from the detector while it is illuminated by the beam, and the method for its use, the use of a pre-object collimator, in the form of a baffle (31), on the X-ray source (30) to be wobbled, and the method for its use, and the use of an X-ray tube as the radiation source (30), as well as the method where wobbling comprises controlling the tube focal spot as discussed above.

Malamud does not teach the apparatus or method of using two separate cathode filaments in one source that can be alternately strobed to create two focal spots.

Khutoryansky et al. teach an X-ray tube having at least two filaments which are individually energized. (See Abstract.)

It would be obvious to anyone of ordinary skill in the art at the time of the invention to use the two-filament tube of Khutoryansky et al. in the apparatus and method of Malamud, in order to extend the life of the X-ray tube, provide advance warning of failure in the second filament, and reduce device failure, as taught by Khutoryansky. (See Column 1 Lines 6-12.)

Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent to Malamud (USP #6,760,399) as applied to claims 1-3 and 13-15 above, in view of U.S. Patent to Schanen et al. (USP #5,218,533).

With respect to Claims 4 and 16, Malamud teaches a multi-slice, helical CT imaging apparatus with a plurality of detector arrays on the z-axis (17 a-b), having a radiation source (30) with a beam focal spot, in which said focal spot is wobbled during scanning to preferentially illuminate individual detectors (33A) and collect data from the detector while it is illuminated by the beam, and the method for its use, the use of a pre-object collimator, in the form of a baffle (31), on the X-ray source (30) to be wobbled, and the method for its use, and the use of an X-ray tube as the radiation source (30), as well as the method where wobbling comprises controlling the tube focal spot as discussed above.

Malamud does not teach the apparatus or method of using the e-beam to illuminate two different focal spots on the cathode of said x-ray tube.

Schanen teaches an X-ray tube wherein two different focal spots on the cathode of said x-ray tube are illuminated by the e-beam. (See Column 2 Lines 46-55.)

It would be obvious to anyone of ordinary skill in the art at the time of the invention to use the X-ray tube of Schanen in the apparatus and method of Malamud, in order to increase the resolution of the image created by the x-ray, as taught by Schanen. (See Column 2 Lines 49-50.)

Claims 8, 10, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent to Malamud (USP #6,760,399) as applied to claims 1 and 13 above, in view of U.S. Patent to Gordon. (USP #6,067,342).

With respect to Claims 8 and 20, Malamud teaches a multi-slice, helical CT imaging apparatus with a plurality of detector arrays on the z-axis (17 a-b), having a radiation source (30) with a beam focal spot, in which said focal spot is wobbled during scanning to preferentially illuminate individual detectors (33A) and collect data from the detector while it is illuminated by the beam, and the method for its use as discussed above.

Malamud does not teach the apparatus or method of using a scintillator/photodiode array for one set of detector arrays and an x-ray number and energy detector array for another set of detector arrays.

Gordon teaches the use of scintillator material in the detector as well as a semiconductor detector that gives information on the dosimetry (i.e. energy and atomic number) of the incident x-ray. (See Column 3 Lines 34-58 and Column 5 Lines 19-30.)

With respect to Claims 10 and 22, Malamud teaches a multi-slice, helical CT imaging apparatus with a plurality of detector arrays on the z-axis (17 a-b), having an x-ray radiation source (30) with a beam focal spot, in which said focal spot can be wobbled, by control of the x-ray tube focal spot, during scanning to preferentially illuminate individual detectors (33A) and collect data from each detector as it is illuminated by the beam, and the method for its use as discussed above.

Malamud does not teach the apparatus or method of using a pulsed radiation source to allow the source to be off during wobbling of the focal spot.

Gordon teaches the used of a pulsed radiation source that provides a pulsed x-ray beam. (See Column 6 Lines 58-59.) It would be obvious to anyone of ordinary skill in the art at the time of the invention to use the pulsed radiation source of Gordon in the apparatus and method of Malamud to avoid errors due to readings taken during the wobble of the beam, and avoid the need for lengthy computerized corrections of the data, as well as to use the pre-object collimator of Gordon in the apparatus and method of Malamud as discussed above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U. S. Patents to: Wagner (USP 4,063,074), Berninger et al.

Art Unit: 2882


(USP# 4,196,352), Sohval (USP # 4,689,809), Haim et al. (USP# 4,916,352), McKenna (USP # 5,473,657), Casey et al. (USP # 5,175,754), Arenson et al. (USP # 5,228,069), Dolazza et al. (USP # 5,841,829), Oppelt et al. (USP # 6,005,908), U.S. Patent Publication to Dunham et al. (PGPUB# 2005/0094762), and published European Patent application to Palermo (EP Application # 84308697.6).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anastasia Midkiff whose telephone number is 571-272-5053. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASM
08/30/05


EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER